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CHALLENGING GOALS AND EFFECTIVE FEEDBACK

Writing can
be a key
example of this

The second school-level factor is “challenging goals and effective feedback.” The factor is primarily a combination of what other researchers have referred to as “high expectations” (or “effective monitoring” as referred to in Marzano, 2000a) and “pressure to achieve” (see Figure 2.3, p. 19). In my terminology, high expectations and pressure to achieve refer to establishing *challenging goals* for students. Monitoring refers to *feedback*—tracking the extent to which goals are met. Given that these elements hold the ranks of third and fourth respectively in my previous study (Marzano, 2000a), I’ve combined them and ranked them second in the list of the five school-level factors.

Pressure to Achieve: Establishing Academic Goals

In reviewing the research underlying this factor, let’s first consider the academic impact of goal setting. Figure 4.1 (p. 36) provides a brief review of some of that research.

Specifically, Figure 4.1 reports the research using the metric of effect sizes (ES) translated into percentile gains. (For a detailed explanation of effect sizes, see Technical Note 4, pp. 190–191.) For example, Mark Lipsey and David Wilson (1993) examined 204 different studies and found that, on average, the act of setting academic goals had an effect size of 0.55. This means that the achievement scores in classes where clear learning goals were exhibited were 0.55 standard deviations higher than the achievement scores for classes where clear learning goals were not established. This differential translates into a 21-percentage point difference in achievement. Considered together, the findings reported in Figure 4.1 are compelling. Specifically, the reported impact of setting goals on student achievement ranges from a low of 18 percentile points to a high of 41 percentile points.

In addition to its impact on achievement, Mike Schmoker (1999) notes that setting academic goals for the school as a whole has

FIGURE 4.1

Research on the Importance of Goal Setting

Synthesis Study	Number of Effect Sizes	Average Effect Size	Percentile Gain
Wise & Okey, 1983*	3	1.37	41
	25	0.48	18
Walberg 1999	21	0.46	18
Lipsey & Wilson 1993	204	0.55	21

*Two effect sizes are listed because of the manner in which effect sizes were reported. Readers should consult the study for more details.

Setting
of
Clear
Goals

a powerful, coalescing effect on teachers and administrators: "Goals themselves lead not only to success but also to the effectiveness and cohesion of a team" (p. 24). Judith Little (1990) corroborates Schmoker's opinion. She found that shared responsibility for common goals was more important in establishing collegiality than interpersonal friendships. Unfortunately, shared goals do not seem to be the norm in schools across the country (Little, 1990; Lortie, 1975). For example, commenting on the research of Susan Rosenholtz (1991), Schmoker (1999) notes

The existence of common goals in schools was rare, and the lack of agreed-upon goals makes schools unique among organizations. She found that there was very little goal consensus—a collective agreement about what to work toward—even though her studies revealed that this element was the heart of what accounted for progress and success (p. 25).

The act of establishing academic goals, then, has strong support as an important factor in

effective schooling. In addition, another critical aspect of academic goal setting is important though less obvious—academic goals should be challenging for all students. This proviso comes directly from the research on expectations.

Ron Edmonds, an icon for the school effectiveness movement of the 1970s, believed that a school must challenge all students to be truly effective. More precisely, he noted that schools must close the achievement gap between those students from low socioeconomic status (SES) backgrounds and those from high SES backgrounds. In fact, high expectations for students, particularly those from low SES backgrounds, are a cornerstone of the school effectiveness research. David Reynolds and Charles Teddlie (2000) comment on the ubiquitous nature of this finding:

High expectations of students has been one of the most consistent findings in the literature. Virtually every review of the topic mentions the importance of this factor, whether British, Dutch, or American (p. 148).

Reynolds and Teddlie further explain that teachers should communicate high expectations directly to students, which implies that clear goals for all students should be established

Monitoring: The Need for Feedback

How do we know if goals are met if effective feedback is not in place? As is the case with goal setting, a strong and broad research base supports the effect of feedback. To illustrate, Figure 4.2 reports findings from several synthesis studies

Again, these are impressive results. The reported impact of feedback in achievement ranges from a low of 21 percentile points to a high of 41. Both of these indicate that academic achievement in classes where effective feedback is provided to students is considerably higher than the achievement in classes where it is not. In fact, a review of almost

8,000 studies led John Hattie (1992) to comment, "The most powerful single modification that enhances achievement is feedback. The simplest prescription for improving education must be 'dollops of feedback'" (p. 9)

Some research findings regarding feedback, however, might temper Hattie's enthusiastic endorsement. To impact student achievement, feedback must have two specific characteristics.

First, it must be timely. Students must receive feedback throughout the learning process—ideally multiple times throughout the school year (Bangert-Drowns, Kulik, Kulik, & Morgan, 1991). Timely feedback provided throughout a learning experience is referred to as "formative" assessment (as opposed to "summative" assessment that occurs at the end of a learning experience only) (Airasian, 1994; McMillan, 2000). In fact, some researchers assert that appropriate and systematic use of formative assessment could drastically improve the achievement of

Feedback to teachers
or students

FIGURE 4.2

Research on the Importance of Feedback

Synthesis Study	Number of Effect Sizes	Average Effect Size	Percentile Gain
Walberg, 1999	20	0.94	33
Bloom, 1976	7	0.54	21
Scheerens & Bosker, 1997	—	1.09	36
Kumar, 1991	5	1.35	41
Haller, Child & Walberg, 1988	20	0.71	26

U.S. students For example, in a major review of the research on assessment, Paul Black and Dylan Wiliam (1998) noted

The research reported here shows conclusively that formative assessment does improve learning The gains in achievement appear to be quite considerable, and as noted earlier, amongst the largest ever reported for educational interventions As an illustration of just how big these gains are, an effect size of 0.7, if it could be achieved on a nationwide scale, would be equivalent to raising the mathematics achievement score of an 'average' country like England, New Zealand or the United States into the 'top five' after the Pacific rim countries of Singapore, Korea, Japan and Hong Kong. (p. 61)

These findings and conclusions create a dilemma for schools that rely primarily on state tests or external standardized tests as their vehicle for feedback. By definition, such feedback is summative.

Second, effective feedback must be specific to the content being learned (Bangert-Drowns, et al., 1991). George Madaus and colleagues found that tests that are not specifically designed to assess a particular school's curriculum frequently underestimate the true learning of students (Madaus, Kellaghan, Rakow, & King, 1979; Madaus, Airasian, & Kellaghan, 1980). Madaus and colleagues (1979) noted

Several of our results clearly indicate that what we call curriculum-sensitive measures are precisely that. Compared to conventional standardized tests, they are clearly more dependent on the characteristics of schools and what goes on in them. (pp. 223-224)

San Diego quick work for this?

The message is clear. Unless a school employs assessments that are specific to the curriculum actually taught, it cannot accurately determine how well its students are learning.

Today, many schools rely on the results from standardized state tests to assess student learning. Although it is true that state tests more accurately reflect the content deemed important by individual states, they are still problematic because the items on such tests sample the content in state standards documents. Indeed, sampling the content within a subject area is the basis for all large-scale assessments. To illustrate, in a report on the nature and function of state-level tests and standardized tests, the National Research Council (1999) noted

No test can possibly tap all the concepts and processes embodied in a subject area. Instead, test makers construct a sample from the entire subject matter, called a domain. The samples that different test makers choose differ substantially. Thus, one can conclude that not only are the domains of [various subject areas] complex, but there are many subdomains and subsets of test elements that can be used to measure them. (p. 67)

State tests are also problematic in their use of very general performance categories. These categories often provide little feedback on specific knowledge and skills. (Cizek, 2001; Hambleton, 2001) For example, the state standard examples in Figure 4.3, p. 39, are modeled after descriptions of novice, apprentice, and proficient mathematics performance for 8th graders.

Clearly the descriptions of the three performance levels in Figure 4.3 are too broad to

provide effective feedback on specific skills and abilities. For example, what is the difference between exhibiting *minimal* understanding of *rudimentary* concepts and skills (novice) and exhibiting *partial* understanding of *basic* concepts and skills (apprentice)?

Figure 4.3 is a composite for illustration only, yet all too often schools rely solely on state tests with performance levels like these as their primary feedback mechanism.

Action Steps

I recommend three action steps to implement challenging goals and effective feedback.

Action Step 1. Implement an assessment system that provides timely feedback on specific knowledge and skills for specific students.

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Effective feedback is specific and formative in nature. Certainly feedback once a year from a state test or standardized test falls well below the minimum frequency level. At a minimum, students should receive quarterly feedback on their academic performance. *Students need to know*

Consequently, schools must establish an assessment system that provides feedback on specific knowledge and skills at least every nine weeks. This automatically rules out state-developed tests on standards, off-the-shelf standardized tests, or even both working in tandem. For all practical purposes, a school has two primary options.

The first is to construct a series of quarterly tests that are specifically designed to assess student competence in essential school-identified content (see action steps 1 and 2 from Chapter 3). Although this is a viable option (see McMillan, 1997, for a discussion), it is usually an expensive one because most schools and districts do not have the time or

FIGURE 4.3

Model of Performance Categories for State Standards

Novice	<ul style="list-style-type: none"> • Demonstrate minimal understanding of rudimentary concepts and skills • Occasionally make obvious connections among ideas providing minimal evidence or support for inferences and solutions • Have difficulty applying basic knowledge and skills • Communicate in an ineffective manner.
Apprentice	<ul style="list-style-type: none"> • Demonstrate partial understanding of basic concepts and skills • Make simple or basic connections among ideas providing limited supporting evidence for inferences and solutions • Apply concepts and skills to routine problem-solving situations • Communicate in a limited manner.
Proficient	<ul style="list-style-type: none"> • Demonstrate general understanding of concepts and skills • Make meaningful, multiple connections among important ideas or concepts and provide supporting evidence for inferences and justification of solutions • Apply concepts and skills to solve problems using appropriate strategies • Communicate effectively

Tie in essential
know to report

resident expertise to construct such tests and must rely on companies that specialize in their design.

A second and much better option is to redesign report cards and grading practices to reflect student competence in specific or "essential" knowledge and skills. I have detailed what this would entail in *Transforming Classroom Grading* (Marzano, 2000b) and will only briefly address it here. Figure 4.4 presents a reporting system that would provide this type of feedback.

The top section of the report card in Figure 4.4 looks quite traditional in that it presents overall subject matter grades. Of course, overall grades do not provide specific feedback (For a discussion of report card options that do not include overall grades, see Marzano, 2000b.) The bottom section contains information about student performance on specific topics and skills. This particular example employs a 100-point scale for each subject matter topic as well as for nonacademic factors such as participation, assignments, working in groups, and following rules.

Many other schemes can be used. A four-point scale might be used for the nonacademic factors or for the nonacademic factors as well as the subject matter topics (for examples of such report cards, see Marzano, 2000b). Figure 4.4 indicates that the student, Cecelia Haystead, is doing relatively well in the mathematics topics of charts and graphs and problem-solving strategies, but she is not faring well in functions. These scores are the aggregate results of formative assessments collected over a period of nine weeks. Thus, the report card depicts the conclusions from a classroom-based assessment system that is both specific and formative.

The information in a nine-week report card like that in Figure 4.4 could be aggregated into a transcript-like report as shown in Figure 4.5, pp. 43–45.

Figure 4.5 represents topic scores from formative assessments collected over a three-year period for grades 6, 7, and 8. The report provides feedback on a wide variety of mathematics and science topics. What is most important about this report is that it would require teachers to keep track of student achievement on only about six topics per quarter. To illustrate, 38 mathematics topics are addressed in Figure 4.5. Some of these topics have two ratings or scores. Some have only one. A teacher provided each rating at the end of a nine-week grading period. In all, there are 69 ratings of the 38 mathematics topics. Given that the transcript covers a three-year period (grades 6, 7, and 8), ratings in mathematics topics were made four times a year or 12 times in three years. If teachers rated six mathematics topics each quarter, 72 (i.e., 6×12) ratings would be made in three years. Of course, computer grade books make this much less labor- and time-intensive. In fact, I commonly tell schools to become acquainted with the various computer grade books and report cards before they start developing their record-keeping and reporting system (For a thorough discussion of computer grade books, see Marzano, 2000b.)

Action Step 2. Establish specific, challenging achievement goals for the school as a whole.

If an effective assessment system is in place, achievement goals can be set for the school as a whole. Mike Schmoker (1999, 2001) provides clear guidance on setting and using

FIGURE 4.4
Sample Report Card

Student: Cecelia Haystead
Grade: 8
Homeroom: Ms. Becker

Mathematics:	79.7	C
Science:	79.4	C
Language Arts:	93.8	A
History/Geography:	82.9	C
Art:	97.7	A
Civics:	85.4	B

Participation:	90.8	B
Assignments:	87.6	B
Working in Groups:	78.2	C
Following Rules:	87.1	B



















Mathematics		
Central tendency & variability	76.5	
Charts & graphs	87.2	
Data collection & samples	78.2	
Functions	68.3	
Problem-solving strategies	88.2	
Participation	94.2	
Assignments	82.1	
Working in groups	70.5	
Following rules	78.4	
Science		
Motion of Earth/moon	71.0	
Energy in Earth's system	82.3	
The solar system	79.1	
The universe	83.9	
Seasons/weather/climate	80.7	
Participation	90.2	
Assignments	84.7	
Working in groups	71.5	
Following rules	82.4	

FIGURE 4.4 (continued)
Sample Report Card

Language Arts		
Writing:		
The writing process	947	
Organization & development	950	
Diction	899	
Style	952	
Reading:		
Reading comprehension	926	
Critical reading	958	
Understanding genre	938	
Participation	971	
Assignments	947	
Working in groups	872	
Following rules	929	
History/Geography		
Colonies & colonialism	883	
Empires & imperialism	779	
Causes & consequences of slavery	795	
Adaptation to the environment	834	
Types of regions	849	
Participation	774	
Assignments	751	
Working in groups	698	
Following rules	881	
Art		
Purposes of art	985	
Art skills	977	
Art & culture	969	
Participation	924	
Assignments	993	
Working in groups	892	
Following rules	960	
Civics		
Human & civil rights	853	
Government representation	816	
Personal responsibility	894	
Participation	905	
Assignments	897	
Working in groups	812	
Following rules	848	

FIGURE 4.5
Sample Mathematics Transcript

Mathematics	Average Rating	Number of Ratings	Most Recent Rating	Highest Rating	Lowest Rating
Area	81.9	2	82.7	82.7	81.0
Central tendency & variability	78.0	2	76.5	79.5	76.5
Charts & graphs	86.1	2	87.2	87.2	84.9
Computation (general)	88.8	2	94.1	94.1	82.7
Coordinate systems	91.2	1	91.2	91.2	91.2
Data collection & samples	77.7	2	78.2	78.2	77.2
Data distributions	82.1	2	81.6	82.9	81.6
Decimals	86.7	2	85.9	87.4	85.9
Division	88.1	2	91.4	91.4	85.6
Equations & inequalities	79.9	1	79.9	79.9	79.9
Estimation	86.9	2	82.3	91.5	82.3
Experiments	84.1	1	84.1	84.1	84.1
Exponents, roots, logs	80.7	2	79.1	82.2	79.1
Expressions	85.5	1	85.5	85.5	85.5
Figures & shapes	85.4	2	87.1	87.1	83.7
Fractions	81.1	2	78.2	84.0	78.2
Functions	69.7	2	68.3	71.0	68.3
Length width height	75.2	1	75.2	75.2	75.2
Lines & angles	83.0	2	82.2	83.8	82.2
Mathematical reasoning	85.7	2	84.7	86.6	84.7
Measurement	81.0	2	79.2	84.7	79.1
Metric system	85.2	2	85.5	85.5	84.9
Motion geometry	82.2	1	82.2	82.2	82.2
Multiplication	75.6	2	74.1	77.0	74.1
Numbers & number systems	76.2	2	77.1	77.1	75.2
Patterns	77.1	2	81.0	81.0	75.2
Perimeter, circumference	74.0	2	72.1	75.8	72.1
Probability	69.4	2	70.0	70.0	68.8
Problem-solving strategies	84.4	2	88.2	88.2	79.8

FIGURE 4.5 (continued)

Sample Mathematics Transcript

Mathematics	Average Rating	Number of Ratings	Most Recent Rating	Highest Rating	Lowest Rating
Proof	87.1	1	87.1	87.1	87.1
Rate & velocity	81.9	2	79.2	84.7	79.0
Ratio, proportion percent	81.0	2	77.1	84.9	77.1
Scale	83.3	2	81.7	84.9	81.7
Sequences & series	86.7	2	89.1	89.1	84.2
Similarity & congruence	80.9	2	80.7	81.1	80.7
Statistics	47.0	2	44.9	51.2	44.9
Units	84.9	1	84.9	84.9	84.9
Volume mass capacity	68.5	2	71.9	71.9	65.1
Overall mathematics	80.7		80.6	82.3	77.1

Sample Science Transcript

Science	Average Rating	Number of Ratings	Most Recent Rating	Highest Rating	Lowest Rating
Atoms & molecules	75.4	2	71.9	78.8	71.9
Characteristics of organisms	74.1	1	74.1	74.1	74.1
Chemical reactions	69.2	1	69.2	69.2	69.2
Classes of organisms	69.0	3	70.9	70.9	68.7
Conservation of matter, energy	77.9	3	77.8	81.7	74.3
Earth systems	75.9	3	77.7	77.9	72.1
Earth's atmosphere	70.2	3	68.5	73.9	68.3
Earth's history	71.5	2	71.1	71.8	71.1
Earth's surface features	79.0	3	78.7	82.1	76.2
Energy in Earth's system	81.0	3	82.3	82.3	77.0
Forces & motion	64.6	1	64.6	64.6	64.6
Forms of energy	71.8	1	71.8	71.8	71.8
Gravity	73.6	2	74.9	74.9	72.2
Life cycles	80.8	3	81.4	81.8	79.2
Motion of Earth, moon	75.2	3	71.0	79.2	75.7

FIGURE 4.5 (continued)
Sample Science Transcript

Science	Average Rating	Number of Ratings	Most Recent Rating	Highest Rating	Lowest Rating
Organism & environment	66.8	1	66.8	66.8	66.8
Position & motion	41.2	1	41.2	41.2	41.2
Reproduction	74.5	2	71.8	77.2	71.8
Rock cycle	85.5	3	91.7	91.7	81.6
Rocks, minerals, soil	74.9	3	71.9	79.9	71.9
Seasons weather, climate	80.5	3	80.7	80.7	80.0
Scientific data	68.5	2	69.9	69.9	67.1
Scientific explanations	72.6	2	74.2	74.2	71.0
Scientific investigation	76.7	2	74.3	79.0	74.3
Solar system	80.3	3	79.1	84.1	77.7
The universe	83.4	3	83.9	87.2	79.1
Vibrations & waves	90.1	1	90.1	90.1	90.1
Water	87.8	3	89.1	89.1	84.2
Water in Earth's system	83.0	3	82.4	85.7	81.0
Overall science	75.0		74.9	72.9	72.2

schoolwide goals. One critical aspect is not to set too many. For example, commenting on the research of Michael Fullan and Andy Hargreaves, he notes: "Many of the schools tackle only one or two achievement goals annually to prevent the over-load that is so clearly the enemy of improvement" (2001, p. 37).

Schmoker identifies a second feature that he refers to as the principle of "rapid results" (Schmoker, 1999). Although he does not necessarily advocate a short-term view of school reform, he asserts that obtaining results in the first year is critical to providing a foundation of success on which to build. His advice is logical and practical—and it works. Among

others, Schmoker (1999, p. 57) lists the following examples of schools that produced observable results in a year or less:

- Between 1997 and 1998, Bessemer Elementary School in Pueblo, Colorado, increased the percentage of students who are at or above grade level in reading from 12 percent to 64 percent.
- George Washington Vocational and Technical School in downtown Brooklyn, New York, reduced the number of students failing every class from 151 to 11 in one semester.
- Amphitheater Middle School reduced

the number of referrals from 250 to 95 in a year's period of time

As these examples indicate, schoolwide goals can be quite varied. However, setting a few goals that can be accomplished in a short period of time is so potentially powerful that Schmoker (1999) refers to it as a "break-through strategy" (p. 56).

Action Step 3. Establish specific goals for individual students.

Establishing goals for individual students is perhaps more powerful than setting a few schoolwide goals. Individual goals have been a staple of special education for decades and are usually presented in the form of Individualized Educational Plans (IEPs).

Martin Covington (1992) maintains that individual student goals are most effective when students are involved in setting them. Schoolwide goals certainly have their place, but they are usually expressed as a percentage of students exhibiting a certain level of achievement in some area. For example, a school might strive for 90 percent of students achieving at or above grade level in reading by year's end. What about the 10 percent of

students who do not meet this goal? Setting schoolwide goals only risks this sector of the student population being systematically excluded from the powerful effects of establishing goals and monitoring progress. Using a report card and transcript like those in Figure 4.4 and Figure 4.5, students, with the help of a counselor or a homeroom teacher, can set quarterly achievement goals for specific topics within specific subject areas.

Summary

Two key elements are required to implement challenging goals and effective feedback: first, challenging goals must be established for all students; second, effective feedback must be specific and formative. I recommended three action steps to establish an assessment system that provides feedback on specific topics to individual students at least once per quarter. To accomplish this, I suggest innovative report cards that use formative classroom assessments. With such a system in place, schoolwide achievement goals, as well as individual student goals, can be set and monitored.